MEMORANDUM FOR: Distribution

FROM: W/OPS1 - John McNulty

SUBJECT: Expansion of Console Replacement System (CRS)

1 Material Transmitted:

Engineering Handbook No. 7 (EHB-7) Communications Equipment, Section 3.4, Modification Note 46, Console Replacement System Output Channel Expansion (Typical 4 to a Maximum 13 configuration).

2 Summary:

Requests for Change NWS627 and NWS504D authorizes CRS expansion for Weather Forecast Offices (WFO) Duluth, Minnesota (DLH) and Sioux Falls, South Dakota (FSD).

3 Effect on Other Instructions:

None.

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COMMUNICATIONS EQUIPMENT MODIFICATION NOTE 46 (for Electronics Technicians)
Maintenance Branch
W/OPS12: GSS

SUBJECT : Console Replacement System (CRS) Output Channel Expansion

PURPOSE : To expand the capabilities of the CRS system from a Typical 4-channel to a Maximum 13-channel configuration.

SITES AFFECTED :

Site Name	SID	Org. Code
WFO Duluth, MN	DLH	WR9745
WFO Sioux Falls, SD	FSD	WR9651

EQUIPMENT AFFECTED : CRS (B440)

PARTS REQUIRED : The parts required will be issued to each site by W/OPS12 from the National Logistics Support Center under the applicable approved site-specific Request for Change.

(1) Front-end processor (FEP) hold-down strap (ASN: B440-STRAP)
(2) FEP computers (ASN: B440-2A2)
(2) FEP hard disk drive (HDD) (ASN: B440-2A2A8-FEP)
(2) Local area network (LAN) board (ASN: B440-1A8A10)
(2) LAN cable segment (ASN: B440-2W1)
(2) BNC tee connector (ASN: B440-4J1)
(2) FEP switch VGA video cables (ASN: B440-2W3)
(2) FEP switch PS/2 keyboard cables (ASN: B440-2W4)
(10) DECtalk card (ASN: B440-2A2A11)
(10) Audio switch module (ASM) cards (ASN: B440-2A6A3)
(10) DECtalk-ASM audio cable (ASN: B440-4W12)
(4) NOAA Weather Radio Specific Area Message Encoder (NWRSAME)-audio control panel (ACP) interface cable (ASN: B440-1A5W4)
(1) DOS formatted diskette with CRS test database ASCII files (provided by W/OPS12)

PARTS SUPPLIED BY THE SITE : The following parts shall be provided by the site:
(9) Transmitter audio output cables
(4) NWRSAME (if available)
Cable marking tags and tie wraps as needed

TOOLS AND TEST EQUIPMENT REQUIRED	:	#1 and #2 Phillips screwdrivers CRS test database ASCII files diskette provided by W/OPS12 (see Parts Required) Small flat-blade jeweler's screwdriver Root mean square (RMS) voltmeter/dB meter 600-ohm dummy load with a RJ-11 plug attached Antistatic workstation kit
TIME REQUIRED	:	5 Hours
EFFECT ON OTHER INSTRUCTIONS	:	None
AUTHORIZATION	:	The authority for this modification is Requests for Change NWS627 and NWS504D.
VERIFICATION STATEMENT	:	The procedure has been verified at National Weather Service Headquarters, Silver Spring, MD (SLVM2).
GENERAL	:	The attachments in this procedure provide instructions for adding output channel(s) to the CRS.
PROCEDURE	:	Attachment **A** provides the procedure for implementing this modification. Attachment **B** (CRS Hardware Drawings) provides reference information. Attachment **C** provides verification of the new physical configuration (used before applying power). Attachment **D** provides the Modification Note-Data Note Pad form. Attachment **E** provides a completed sample of a WS Form A-26, Maintenance Record.

REPORTING INSTRUCTIONS : Report the completed modification on a WS Form A-26 according to the instructions in Engineering Handbook No. 4 (EHB-4), Engineering Management Reporting System (EMRS), Part 2, and Appendix I. Include the following information on the WS Form A-26:

a. An equipment code of **CRSSA** in block 7.
b. A serial number of **001** in block 8.
c. The **ASN** and **NSN** of the 2 FEPs, 10 ASM cards, and 10 DECtalk cards in block 13.
d. A Mod No. of **46** in block 17a.
e. **Serial numbers** for the FEPs, ASM cards, and DECtalk cards in block 18.

Attachment E provides a sample WS Form A-26.

John McNulty
Chief, Maintenance, Logistics, and Acquisition Division

Attachment A—Modification Procedure
Attachment B—CRS Hardware Drawings
Attachment C—New Configuration Physical Verification
Attachment D—Modification Note-Data Note Pad
Attachment E—WS Form A-26 Sample

Attachment A

Modification Procedure

Attachment A
Modification Procedure

Overview

This modification note provides instructions for expanding a Console Replacement System (CRS) from a Typical 4-channel configuration to a Maximum 13-channel configuration. The modification procedure contains seven parts:

1. CRS Power-Down Procedures
2. Equipment Upgrade Procedures
3. CRS Power-Up Procedures
4. CRS Login, Application Software Error Verification, and Test Database ASCII File Loading Procedures
5. Post Hardware Expansion Channel Operability Verification Procedures
6. Adding New Transmitter Channels and Editing Site Database ASCII File Procedures
7. ASM Alignment Procedures

NOTE: 1. Read the entire procedure, and verify receipt of all required parts before proceeding with the actual modification.

2. Coordinate with the operations staff before performing this procedure.

CAUTION

CRS must be down to perform the expansion modification. This modification contains test messages that should not be broadcast on any transmitter.

In addition, the database ASCII file will be recompiled, and all dictionary files will be lost! Switch to the backup NWR system, and ensure the dictionary files are backed up (see the *CRS System Administration Manual*) before performing this modification.

NOTE: 3. You can perform the new FEP setup procedures in part 2, sections 2.1, 2.2, and 2.3 before shutting down the system. This will save downtime on an operational CRS system.

PART 1–CRS POWER-DOWN PROCEDURES

1.1 CRS Application Shutdown Procedure

1. Click on the *System* menu then click on **Stop System**.
2. Wait until all icons on the *CRS System Status* menu turn **red**.

1.2 UNIX Shutdown Procedure

NOTE: 1. The shutdown of the CRS application is just one task before the graceful power down. After stopping the CRS application software, implement a "controlled/orderly UNIX shutdown with NO automatic reboot" on the main processor (MP), and implement a "controlled/orderly UNIX shutdown" on all front-end processors (FEP). Once the controlled/orderly UNIX shutdown is completed, power down the processors in the following order: MPs then FEPs.

1. Click on the **Maintenance** menu in the main *CRS* menu to access the *Maintenance* pull-down menu.
2. Click on **UNIX Shell** in the *Maintenance* pull-down menu. A *UNIX xterm* window pops up for the entry of UNIX commands.
3. Type the following UNIX command in the *xterm* window:

   su root
4. Press the **Enter** key. The shell responds with a prompt to enter root passwords.
5. Type the password for the root.
6. Press the **Enter** key. The shell prompt changes to a pound sign indicating all subsequent UNIX command entries have root authority.
7. Type the following UNIX command in the *xterm* window:

   rsh 5MP /sbin/shutdown -i0 -g0 -y
8. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 5MP. UNIX on processor 5MP shuts down.
9. Type the following UNIX command in the *xterm* window:

   rsh 1FEP /sbin/shutdown -i0 -g0 -y
10. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 1FEP. UNIX on processor 1FEP shuts down.

11. Type the following UNIX command in the *xterm* window:

    rsh 4BKUP /sbin/shutdown -i0 -g0 -y

12. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 4BKUP. The UNIX on processor 4BKUP shuts down.

13. Type the following UNIX commands in the *xterm* window:

    a. **cd /**

    b. Press the **Enter** key.

    c. Type **/sbin/shutdown -i0 -g0 -y**

    d. Press the **Enter** key. Each CRS processor for the system may be safely powered down when UNIX indicates shutdown is complete with the following message:

    Press any key to reboot…

NOTE:	2. Do not reboot any machine; go to step 1.3.

1.3 CRS Hardware Power-Down Procedure

Power-down all CRS equipment at the operator's station and in the equipment room by turning off the following equipment:

Operators Station	Equipment Room
0MP and Monitor	4BKUP
5MP and Monitor	1FEP
NWRSAME (all)	LAN Bridge
	LAN Server
	Monitor
	Printer
	Audio switching assembly (ASA) power supplies
	Modem

PART 2–EQUIPMENT UPGRADE PROCEDURES

NOTE:
1. Perform the new FEP setup procedures in part 2, sections 2.1, 2.2, and 2.3 before starting the system modification. This will save downtime on an operational CRS system.
2. Attachment **D** contains the Modification Note-Data Note Pad. Complete the form while performing the modification. Use the completed form to report serial number data in EMRS.

2.1 Preliminary Setup of 2FEP and 3FEP Procedures

NOTE: You must remove and replace circuit cards in an antistatic work area using approved antistatic procedures.

1. Remove the right side cover of the new 2FEP unit using the following procedure:
   a. Remove the right three screws on the back of the system unit (see attachment **B,** figure A-1). These screws secure the right side access panel of the system to the chassis.
   b. Pull the panel backward while lifting it upward.
2. Remove the screws holding expansion slot covers 1 through 6 and retain the screws (see attachment **B**, figure A-13).
3. Remove the expansion slot covers.
4. Install the new LAN card (ASN: B440-1A8A10) in expansion slot number 1, and reinstall a retaining screw.

2.2 Installation of the HDD and Cage Combination Procedure

1. Align the three slides on the HDD cage with the three slots on the upper left corner of the chassis.
2. Insert the slides into the slots holding the HDD cage at an angle away from the chassis.
3. Slide the HDD cage towards the bottom of the chassis, and swing the HDD cage into the chassis body.
4. Align the two screw slots at the top with the threaded holes in the chassis, and secure the HDD cage with two screws.
5. Secure the HDD cage with a single screw at the tab at the lower right corner of the HDD cage (see attachment **B**, figure A-13).

6. Hook up the HDD cable to the HDD. Cable connectors are keyed and only fit one way. Connect the other end of the HDD cable to the SCSI connector on the 2FEP motherboard.

7. Connect a power connector from the power supply to the hard disk drive.

2.3 DECtalk Cards Input/Output (I/O) Address Configuration Procedure

1. Configure each installed DECtalk card and the new DECtalk card(s) for the appropriate I/O address through switch 2 (SW2) as defined in table 1 and pictured in attachment **B**, figure A-11.)

NOTE: 1. Depending on the CRS site configuration, there may be as many as five DECtalk cards per FEP in slots two through six.

Table 1. DECtalk Card Switch 2 (SW2) Settings

Module Number	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	I/O Address	PC Slot
4	off	off	off	off	on	on	380	6
3	off	off	on	on	off	on	360	5
2	on	off	on	off	off	on	328	4
1	off	on	off	on	off	off	250	3
0	off	off	off	on	off	off	240	2

NOTE: 2. Regardless of FEP, DECtalk card configuration remains constant, meaning modules 0, 1, 2, 3, and 4 are configured the same for each FEP.

2. Use table 1 to set up a DECtalk card with the I/O address: 240
Install the DECtalk card into slot 2 of 2FEP, and reinstall a retaining screw.

3. Using table 1, set up a DECtalk card with the I/O address: 250
Install the DECtalk card into slot 3 of 2FEP, and reinstall a retaining screw.

4. Using table 1, set up a DECtalk card with the I/O address: 328
Install the DECtalk card into slot 4 of 2FEP, and reinstall a retaining screw.

5. Using table 1, set up a DECtalk card with the I/O address: 360
Install the DECtalk card into slot 5 of 2FEP, and reinstall a retaining screw.

6. Using table 1, set up a DECtalk card with the I/O address: 380
Install the DECtalk card into slot 6 of 2FEP, and reinstall a retaining screw.

7. Replace the 2FEP cover using the reverse procedure in section 2.1, step 1.

8. Perform all steps of sections 2.1, 2.2, and 2.3 on the new 3FEP.

NOTE: 3. Before proceeding, perform Part 1, CRS Power-Down Procedure.

2.4 2FEP and 3FEP Computer Installation Procedure

1. Install 2FEP and 3FEP in the CRS main unit cabinet.
2. Install the new 2FEP switch VGA video cable (ASN: B440-2W3) between 2FEP video out and switch position B.
3. Install the new 3FEP switch VGA video cable (ASN: B440-2W3) between 3FEP video out and switch position C.
4. Install the new FEP switch PS/2 keyboard cable (ASN: B440-2W4) between 2FEP keyboard connection and switch position B.
5. Install the new FEP switch PS/2 keyboard cable (ASN: B440-2W4) between 3FEP keyboard connection and switch position C.
6. Install the new LAN cable segment (ASN: B440-2W1) and BNC tee (ASN: B440-4J1) connector to connect the 2FEP PC into the existing CRS LAN (2FEP connects between 4BKUP and 3FEP). (See attachment **B**, figure A-15).
7. Install the new LAN cable segment (ASN: B440-2W1) and BNC tee (ASN: B440-4J1) connector to connect the 3FEP PC into the existing CRS LAN (3FEP connects between 2FEP and 5MP). (See attachment **B**, figure A-15).

2.5 ASM Card Installation Procedure

1. Remove ASA slots 5, 6, 7, 8, 9, 10, 11, 12, 13, and PB2 covers by removing the two screws.

NOTE: There are five jumpers to be set on each ASM card.

2. Take one of the new ASM cards (ASN: B440-2A6A3), and set the jumpers for slot 5 of the ASA in accordance with table 2.
3. Install the new ASM card into slot 5 of the ASA chassis, and tighten the two screws.
4. Repeat steps 2 and 3 for each of the remaining ASM cards.

Table 2. ASM Card Jumper Settings

	ASA Slot #	Silence Alarm Jumper "JP1"	ACP Channel Sel. Jumper "JP2" & "JP3"	BKUP Live/ Playback Cntrl Jumper "JP4"	FEP Select Jumper "JP5"
ASM 1 (channel 1)	1	EN (Enable)	1	BUL2	FEP1
ASM 2 (channel 2)	2	EN (Enable)	2	BUL2	FEP1
ASM 3 (channel 3)	3	EN (Enable)	3	BUL2	FEP1
ASM 4 (channel 4)	4	EN (Enable)	4	BUL2	FEP1
ASM 5 (channel 5)	5	EN (Enable)	5	BUL2	FEP2
ASM 6 (channel 6)	6	EN (Enable)	6	BUL2	FEP2
ASM 7 (channel 7)	7	EN (Enable)	7	BUL2	FEP2
ASM 8 (channel 8)	8	EN (Enable)	8	BUL2	FEP2
ASM 9 (channel 9)	9	EN (Enable)	9	BUL2	FEP3
ASM 10 (channel 10)	10	EN (Enable)	10	BUL2	FEP3
ASM 11 (channel 11)	11	EN (Enable)	11	BUL2	FEP3
ASM 12 (channel 12)	12	EN (Enable)	12	BUL2	FEP3
ASM 13 (channel 13)	13	EN (Enable)	13	BUL2	FEP3
ASM PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	FEP1
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	FEP2

2.6 New DECtalk-ASM Audio Cable Installation Procedure

Using the write-on cable labels, mark and connect the DECtalk-ASM audio cables in accordance with table 3.

Table 3. DECtalk to ASM Audio Cables

From	To	Cable Label
1FEP DECtalk 1 “J2” Port	ASM 1 “IN Port”	1-1
1FEP DECtalk 2 “J2” Port	ASM 2 “IN Port”	1-2
1FEP DECtalk 3 “J2” Port	ASM 3 “IN Port”	1-3
1FEP DECtalk 4 “J2” Port	ASM 4 “IN Port”	1-4
2FEP DECtalk 1 “J2” Port	ASM 5 “IN Port”	2-1
2FEP DECtalk 2 “J2” Port	ASM 6 “IN Port”	2-2
2FEP DECtalk 3 “J2” Port	ASM 7 “IN Port”	2-3
2FEP DECtalk 4 “J2” Port	ASM 8 “IN Port”	2-4
3FEP DECtalk 1 “J2” Port	ASM 9 “IN Port”	3-1
3FEP DECtalk 2 “J2” Port	ASM 10 “IN Port”	3-2
3FEP DECtalk 3 “J2” Port	ASM 11 “IN Port”	3-3
3FEP DECtalk 4 “J2” Port	ASM 12 “IN Port”	3-4
3FEP DECtalk 5 “J2” Port	ASM 13 “IN Port”	3-5
1FEP DECtalk 5 “J2” Port	ASM PB1 “IN Port”	1-5
2FEP DECtalk 5 “J2” Port	ASM PB2 “IN Port”	2-5

2.7 Installation Procedure for New Transmitter Audio Output Cables

1. Connect the “OUT” 1 port of the new ASM cards at slots 5, 6, 7, 8, 9, 10, 11, 12, and 13 of the ASA chassis by installing the new audio output cable to the demarc panel position.
2. Install the new NWRSAMEs into the top panel of the 5MP workstation (if available).
3. Install the NWRSAME-ACP interface cable from the encoder rear connector to the “NWRSAME INPUTs socket 1” port of ACP2 rear panel (this connects to pins 2, 6, 7, 9, and 10 of the NWRSAME) (if available).

NOTE: This completes the hardware modification.

PART 3–CRS POWER-UP PROCEDURES

*****WARNING*****

Before powering up the FEPs, perform the *New Configuration Physical Verification* procedure in attachment C to ensure proper system configuration. Failure to perform the procedure can result in transmitter broadcasts assigned to incorrect output channels.

3.1 Power-Up FEP Procedure

1. Press the **ON/OFF** switch (on the front center right of the enclosure) to power up the FEPs. A green power LED on each FEP lights when the power is on. The FEPs can be powered up in any sequence. The FEPs go through a memory check, display the system configuration [as recognized by the basic I/O system (BIOS)], then boot the embedded operating system. At the completion of the boot process, the *Console Screen* displays the prompt:

   Console Login:

   The embedded operating system automatically initializes to a pre-set level and then waits for final start-up commands from the master MP.

NOTE: The FEPs share a common console through the *Shared Monitor Switch*. The console displays messages while completing the boot process of the current FEP.

2. Use the *Shared Monitor Switch* to select the next FEP. The console monitor displays:

   Press <F1> to resume, <F2> to Setup.

3. Press **F1** to complete the boot process. The prompt displays:

   Console Login:

4. Repeat for each FEP.

3.2 Power-Up Main Processors Procedure

NOTE: 1. Power-up 0MP as the master main processor and 5MP as the shadowing processor.

Press the **ON/OFF** switch (front center right of the enclosure) to power up the MPs. A green power LED on each MP lights when the power is on. The MPs can be powered up in any sequence. The MPs go through a memory check, file

system check, system configuration verification (as recognized by the BIOS), and then boot the embedded UNIX operating system. At the completion of the boot process, the *Workstation Screen* displays the *CRS Login Screen*. The MPs are now ready for the initialization of the CRS application software.

NOTE:

2. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. To continue the login process, click on the **Acknowledge** button.
3. Whenever the MPs are powered up, they automatically step through the boot process to the multiuser mode without operator intervention.

3.3 CRS Application Software Installation on the New FEP Procedure

1. From an MP workstation at the *CRS Login Screen*, type **root** (to logon as root) in the *Login ID* field, and press **Enter**. The cursor moves to the *Password* field.
2. Type in your assigned password, and press **Enter** to complete the CRS login process. The system displays the *UNIXWare Desktop*.
3. Double-click the **Admin_Tools** icon from the *UNIXWare Desktop*. The *Admin Tools* window displays.
4. Double-click the **App_Installer** icon from the *Admin Tools* window. The *Application Installer* window displays. This screen is divided into two windows. Do all the following procedures in the upper window.

NOTE:

1. You will need the CD that has your current version of software loaded on the CRS system.

5. Place the CD with the CRS software into the CD-drive.
6. Select **CD-ROM_1** from the upper window as your media to install. Three icons display: **crsopsais** (auto installer), **crsopsfpm** (FEP multi-pack), and **crsopsmpm** (MP multi-pack).
7. Select **crsopsais**, and click the **Install** button on the right side of the upper window. The *auto_install* window displays and the installation script starts. The installation script stops and waits for you to select an installation type. The following statements display:

   Build installation options.
   a) all processors (0MP, 5MP, 1FEP, 2FEP, 3FEP, 4BKUP)
   f) front-end processors (1FEP, 2FEP, 3FEP, 4BKUP)
   m) master processors (0MP, 5MP)
   s) specific processor
   Select Installation Option (default: a)

8. Type **a** then press **Enter**. The system displays numerous installation status messages on the *auto_install* window. Follow the on-screen instructions and answer any questions. When the installation process is complete, the CRS displays:

   Continue 0MP shutdown? (default: y)

9. Press **Enter** to reboot 0MP.

NOTE: 2. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. To continue the login process, click on the **Acknowledge** button. The *Login Screen* displays.

10. Use the *Shared Monitor Switch* on the equipment rack to select the next FEP for rebooting. The console monitor displays:

    Press F1 to resume, F2 to Setup.

11. Press **F1** to complete the boot process. The prompt displays:

    Console Login:

12. Repeat for each FEP.

PART 4–CRS LOGIN, APPLICATION SOFTWARE ERROR VERIFICATION, AND TEST DATABASE ASCII FILE LOADING PROCEDURES

4.1 CRS Login Procedure

NOTE:
1. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. To continue the login process, click on the **Acknowledge** button.
2. The *CRS Login Screen* allows you to log onto CRS. The two fields enable you to enter your assigned *Login ID* and *Password.*

1. Type **admin** (for system administrator) in the Login ID field, and press **Enter**. The cursor moves to the *Password* field.
2. Type in your assigned password, and press **Enter**. The system displays the *CRS Main* display. In addition, the system displays the following error message:

   System is not operational. Perform 'Start CRS' to start system.

3. Click on **OK** to clear the message.

NOTE: 3. The error message just indicates CRS is not running.

4.2 CRS Applications Software Installation Error Verification Procedure

1. Open a UNIX Shell:
   a. Click on **Maintenance**.
   b. Click on **UNIX Shell**.
2. Type **grep ERROR /crs/install.log** then press **Enter**.
3. Ensure there are no error messages. Any error messages must be reported to the CRS Site Support Staff at 301-713-0191 x145 or x144.
4. Type **grep WARNING /crs/install.log**, and press **Enter**.
5. Ensure there are no error messages. Any error messages must be reported to the CRS Site Support Staff at 301-713-0191 x145 or x144.

NOTE: Ignore any IP address error messages.

4.3 CRS Test Database ASCII File Loading Procedure

NOTE: 1. The following instructions for loading the CRS test database ASCII file assume everything is being done with 0MP set as the MP.

1. Place the diskette with CRS test database ASCII files in the 0MP diskette drive to copy the desired file from the diskette to CRS.
   a. Type **dosdir a:** then press the **Enter** key to display a directory listing of the files on the test database diskette. There are 13 files on the diskette with the following filename convention:

      Typ*W*_CFG.ASC where *W* = 1 - 4
      Lrg*X*_CFG.ASC where *X* = 5 - 8
      Max*Y*_CFG.ASC where *Y* = 9
      Max*Z*_CF.ASC where *Z* = 10 - 13

      (*W*, *X*, *Y*, and *Z* represent the number of transmitters your CRS supports.)
   b. Find the applicable test database ASCII file.
   c. Type **doscp a:*filename* /crs/data/SS/*filename*** (where *filename* is the name of the CRS test database ASCII file to be used).
   d. Press the **Enter** key.
2. Click and hold the left mouse button on any white space, move the cursor to select **XCRS_SITE Utility,** and release the button to bring up the *XCRS_SITE Utility* window.
3. Click on the **Select ASCII Site Setup** button to bring up the list of ASCII files.

4. Select the desired database ASCII filename copied from the diskette in section 4.3, step 1.c, and double click.

NOTE: 2. The directory selection block has a default directory name of */crs/data/SS*. The file filter block has a default file name of */crs/data/SS/*.ASC*. If the desired filename does not appear, it may have copied to the wrong directory in section 4.3, step 1.c. In that case, change the default directory name to the directory specified in section 4.3, step 1.c. Another reason the filename might not appear is because it is being filtered out. Remember, UNIX is case sensitive and if the filename is copied with an asc extension in lower case, it will not display. Change the filter file name to */crs/data/SS/*.asc*, and the filename should display.

5. Select *Initialize System Configuration and Database* to ensure the entire system database and configuration is erased and replaced.

6. Click on the **Start Site Configuration** button. The system displays:

   Will now perform FULL site reconfiguration. Continue?

7. Click on **OK**. The "wristwatch" and "working" messages display. Several messages scroll by. The last message reads:

   Finished with site configure

   The "wristwatch" and "working" messages disappear. Ensure there are no error messages when you complete the site configuration process.

8. Restart CRS by clicking on **Start CRS System**. The system displays:

   The CRS system will be STARTED. Continue?

9. Click on **OK**. The "wristwatch" and "working" messages display. Several messages scroll by. The last message refers to starting 4BKUP. The "wristwatch" and "working" messages disappear.

10. Click on **EXIT** to close the *XCRS_SITE Utility* window.

11. Click on the **UNIX Shell** window to select it. At the prompt, type **exit** and press **Enter** to close the *UNIX Shell.*

12. Open the *System Status* window:

    a. Click on **System**.

    b. Click on **System Status**.

13. Monitor the *System Status* window and ensure the system is operational.

PART 5–POST HARDWARE EXPANSION CHANNEL OPERABILITY VERIFICATION PROCEDURES

5.1 Channel Operability Verification Procedure

NOTE:	CRS test database ASCII files contain test messages configured for continuous broadcast to verify channel operability.

1. Connect a monitor speaker or headphones to the ACP.
2. Using the **Channel Select** control, select each channel, one at a time, and monitor the output for the correct message (i.e., with channel one selected, the message output is: *This is transmitter one, audio switch module one.*)

5.2 FEP Backup Mode Channel Operability Verification Procedure.

1. Click on **Maintenance**.
2. Click on **Front-End Processor Switch**.
3. Select **3** in the *Front-End Processor Switch* window under FEP.
4. Select **Out** under Switch.
5. Select **Yes** under Backup
6. Click on the **Save the current record** icon to execute the FEP switch process. The *Question* box displays:

   Switch out the FEP FULLY offline ???
7. Click on **OK** to continue. The system displays the “wristwatch” and the message:

   Requesting FEP Switchout
8. Monitor the *FEP3* and *BKUP* system status icons, and verify FEP3 is in backup mode and the BKUP icon displays the online status.
9. Upon completion of the FEP switch process, repeat section 5.1, steps 1 and 2.
10. Upon completion of the FEP backup mode channel operability verification, perform the following to display the *Front-End Processor Switch* window:
    a. Click on **Maintenance**.
    b. Click on **Front-End Processor Switch**.
11. Select **3** in the *Front-End Processor Switch* window under FEP.
12. Select **IN** to switch FEP3 back in under *Switch*.

13. Click on the **Save the current record** icon to execute the FEP switch process. The system displays the “wristwatch” and the message:

    Requesting FEP switch-in…

14. Monitor the *FEP3* and *BKUP System Status* icons, and verify FEP3 is online and the BKUP icon displays the backup mode status.

15. When the system returns to normal operation, perform the following steps to close the *Front-End Processor Switc*h window and stop CRS:

    a. On the *Front-End Processor Switch* window:

        1) Click on **File**.

        2) Click on **Exit**.

    b. On the *Main CRS* menu:

        1) Click on **System**.

        2) Click on **Stop System**.

        3) Click on **OK**.

        4) Click on **Close**.

16. Monitor the *System Status* window, and verify the CRS application has stopped.

PART 6–PROCEDURES FOR ADDING NEW TRANSMITTER CHANNELS AND EDITING SITE DATABASE ASCII FILE

6.1 Adding New Transmitter Channels Procedure

1. Click and hold the left mouse button on any white space, move the cursor to select **XCRS_SITE Utility,** and release the button to bring up the *XCRS_SITE Utility* window.

2. Click on **Select ASCII Site Setup** button to bring up the list of ASCII files.

3. Select the current site database ASCII file, and double click.

4. Click on **Add Transmitter(s)** button to start the **addxmt** program. It displays the number of transmitters currently available, the next available transmitter to be added, and its appropriate processor and slot.

5. Use the following sequence of steps for each transmitter to be added:

    a. **Mnemonic**

        1) Type option number **1** and press **Enter** to select *Mnemonic*.

        2) Type **a** and press **Enter** at the program prompt to add *Mnemonic*.

3) Type **mmmmm** and press **Enter** (where mmmmm is the desired *Mnemonic*), up to a length of 5 characters. The program returns the *Mnemonic*.

4) Type **0** or **Tab** and press **Enter** to complete the *Mnemonic* selection.

b. **Call Sign**

1) Type option number **2** and press **Enter** to select *Call Sign*.

2) Enter the *Call Sign* in the same manner as the *Mnemonic*, up to a length of 5 characters. The program returns the *Call Sign*.

3) Type **0** or **Tab** and press **Enter** to complete the *Call Sign* selection.

c. **Frequency**

1) Type option number **3** and press **Enter** to select *Frequency*. The *Frequency* option only allows you to select one of the seven choices listed.

2) Type **n** and press **Enter** (where n is the desired frequency choice). The program returns the *Frequency* choice by displaying an asterisk next to the *Frequen*cy selection.

3) Type **0** or **Tab** and press **Enter** to complete the *Frequency* selection.

d. **Location**

1) Type option number **4** and press **Enter** to select *Location*.

2) Enter *Location* (in the same manner as *Mnemonic* and *Call Sign*) up to a length of 40 ASCII characters. The program returns the *Location*.

3) Type **0** or **Tab** and press **Enter** to complete the *Location* selection.

e. **Add Transmitter**

1) Type option number **5** and press **Enter** to use all the parameters defined in the first four steps to configure a new transmitter in the database ASCII file. The program verifies a new transmitter is needed.

2) Type **y** and press **Enter**. The program returns the assignment of each transmitter to its proper processor and slot. The program tells you the appropriate database ASCII file has been updated, and the original has been saved with the .SAV extension.

6. The program then asks if another transmitter is needed. If yes, repeat steps **5a** through **e** for the next new transmitter. If not, type **n** and press **Enter** to exit the program.

6.2 Editing the Site Database ASCII File Procedure

1. When exit **addxmt** is done, the *Question* box displays:

Ready to recompile selected ASCII file. Continue?

2. Click on **Cancel** to close the *Question* box.

3. Select *Initialize System Configuration and Database* to ensure the entire system database and configuration is erased and replaced.

4. Click on **Start Site Configure**. The *Question* box displays:

   Will now perform FULL site reconfiguration. Continue?

5. Click on **OK** to recompile the database ASCII file. Upon completion of the database ASCII file recompile process, the system displays:

   Finished with site configure.

6. Restart CRS by clicking on **Start CRS System**. The system displays:

   The CRS system will be STARTED. Continue?

7. Click on **OK**. The "wristwatch" and the "working" message display. Several messages scroll by. The last message refers to starting 4BKUP, and the "wristwatch" and "working" message disappear.

8. Click on **Exit** to close the *XCRS_SITE Utility* window.

9. Open the *Alert Monitor* window:

   a. Click on **System**.

   b. Click on **Alert Monitor**.

NOTE: No attempt is made by **addxmt** to establish station identifiers, broadcast programs, broadcast suites, message types, voice parameters, keep-alive messages, interrupt messages, etc. for the new transmitters. These must be configured through the CRS graphical user interface (see the *CRS Site Operator's Manual*) and updated in the site database ASCII file.

PART 7–ASM ALIGNMENT PROCEDURES

NOTE: You must realign the output of each added ASM card before placing it in service. The alignments must be done in the following sequence:

1. Verify ACP Ref. Mark Alignment.
2. ASM Card Alignment.

7.1 Verify ACP Ref. Mark Alignment Procedure

NOTE:
1. You can perform the ACP Ref. mark alignment independently. It does not require the use of any tools or equipment.
2. Transmitter x in this procedure refers to the channel under test.

1. Set up the CRS for backup live (BUL). No system database is required.
2. Set the index mark on the **tone volume control** knob to the Ref. position.
3. Push the **Transmitter x** and **Enable** buttons in sequence to start BUL on channel x. The buttons are in the **BACKUP LIVE** block area on the ACP front panel.

NOTE: 3. Do not send audio to a transmitter while performing this procedure.

4. Push the **Alert Tone 1** button to generate the 1050 Hz warning alert tone (WAT).
5. Ensure the VU meter on the ACP front panel indicates **0 dBm**.

NOTE: 4. The duration of 1050 Hz WAT is 10 seconds.

6. Adjust the tone volume control for a reading of **0 dBm**.
7. Repeat steps 4, 5, and 6 as necessary to obtain a reading of **0 dBm**.

NOTE: 5. When the tone volume control is set to the true Ref. position, the ACP provides the selected WAT output level of **0 dBm**.

8. To stop BUL, first push the **Enable** button, then push the **Transmitter x** button.

7.2 ASM Card Alignment Procedure

NOTE:
1. This alignment requires two people: one in the operations room, and one in the equipment room.
2. When performing any of the following alignments, the system's output(s) must be disconnected from the telecommunications link and terminated into a 600-ohm load. All audio signal level measurements are taken across the 600-ohm load.

1. Assemble the following required Equipment:
   - dB Meter to read the audio signal level,
   - Small jeweler's screwdriver
   - 600-ohm dummy load with RJ-11 plug attached.
2. Set up the CRS for BUL. No system database is required.
3. Set the index mark on the **tone volume control** knob to the **Ref.** position as described in section 7.1.
4. Push the **Transmitter x** and **Enable** buttons in sequence to start BUL on channel x. The buttons are in the **BACKUP LIVE** block area on the ACP front panel.
5. Plug the RJ-11 connector (with the 600-ohm load attached) into the RJ-11 jack of **OUT 1** on the ASM of transmitter x (output channel x).
6. Connect the dB meter across the 600-ohm load.
7. Push the **Alert Tone 1** button to send a WAT to the **OUT 1** jack of ASM card 1.
8. Measure and record the signal level in dB across the 600-ohm load.
9. Using a small jeweler's screwdriver, adjust the transmitter gain control potentiometer through the ASM front panel until a reading of **0 dBm** is obtained across the 600-ohm load.

NOTE:
3. Table 4 provides equivalent V rms and V p-p values related to dBm (all referenced to 600-ohms) to help reference readings taken with measurement equipment not read directly in dBm.

Table 4. Voltages vs dBm (into 600-ohm load)

dBm	RMS	P-P	dBm	RMS	P-P	dBm	RMS	P-P
10	2.440	6.93	-4	0.480	1.35	-17	0.110	0.301
9	2.183	6.17	-5	0.430	1.20	-18	0.097	0.270
8	1.946	5.50	-6	0.390	1.03	-19	0.087	0.240
7	1.734	4.90	-7	0.345	0.96	-20	0.0775	0.215
6	1.546	4.37	-8	0.306	0.85	-21	0.690	0.194
5	1.377	3.89	-9	0.275	0.76	-22	0.061	0.170
4	1.228	3.47	-10	0.245	0.68	-23	0.054	0.152
3	1.094	3.01	-11	0.213	0.61	-24	0.048	0.135
2	0.975	2.75	-12	0.192	0.54	-25	0.043	0.120
1	0.869	2.46	-13	0.173	0.48	-26	0.039	0.108
0	0.775	2.15	-14	0.154	0.43	-27	0.034	0.096
-1	0.690	1.94	-15	0.138	0.38	-28	0.031	0.085
-2	0.610	1.70	-16	0.125	0.34	-29	0.028	0.076
-3	0.540	1.52				-30	0.024	0.068

NOTE:

4. The WAT output from the ACP nominally lasts 10 seconds. A second person should push the **Alert Tone1** button for a near continuous tone output. This will smooth out the calibration effort and minimize the time required.
5. Primary (Out1) and secondary (Out2) outputs are two independent outputs; however, the output level of Out1 is affected by about 1.5 dB if Out2 is loaded.
6. During BUL, the VU meter monitors the ACP tone output, not the ASM card output. The ACP tone output is sent to the ASM card via the ASC for final output.

10. Repeat steps 7, 8, and 9 as needed to obtain a reading of **0 dBm** for the channel under test.
11. To stop BUL, push the **Enable** button, then push the **Transmitter x** button.
12. Repeat steps 1 through 10 to align each of the new ASM cards in the system.
13. Activate each ASM card output by pushing the respective **Transmitter x** button, and then the **Enable** button.

Attachment C

New Configuration
Physical Verification

Attachment C
New Configuration Physical Verification

13-channel System:

Required MPs, FEPs, DECtalks, ASC, and ASMs

The **MAXIMUM-13** system has 2 MPs (0MP and 5MP), 4 FEPs (1FEP, 2FEP, 3FEP, and 4BKUP), 20 DECtalk cards, 1 ASC card, and 16 ASM cards:

0MP	main processor 1		
5MP	main processor 2		
1FEP	front end processor 1		
	LAN Card	LAN interface	(slot 1)
	DECtalk 1	channel 1	(slot 2)
	DECtalk 2	channel 2	(slot 3)
	DECtalk 3	channel 3	(slot 4)
	DECtalk 4	channel 4	(slot 5)
	DECtalk 5	PB1	(slot 6)
2FEP	front end processor 2		
	LAN Card	LAN interface	(slot 1)
	DECtalk 1	channel 5	(slot 2)
	DECtalk 2	channel 6	(slot 3)
	DECtalk 3	channel 7	(slot 4)
	DECtalk 4	channel 8	(slot 5)
	DECtalk 5	PB2	(slot 6)
3FEP	front end processor 3		
	LAN Card	LAN interface	(slot 1)
	DECtalk 1	channel 9	(slot 2)
	DECtalk 2	channel 10	(slot 3)
	DECtalk 3	channel 11	(slot 4)
	DECtalk 4	channel 12	(slot 5)
	DECtalk 5	channel 13	(slot 6)
4BKUP	backup front end processor		
	LAN Card	LAN interface	(slot 1)
	DECtalk 1	backup channel 1, 5, or 9	(slot 2)
	DECtalk 2	backup channel 2, 6, or 10	(slot 3)
	DECtalk 3	backup channel 3, 7, or 11	(slot 4)
	DECtalk 4	backup channel 4, 8, or 12	(slot 5)
	DECtalk 5	backup PB1, PB2, or 13	(slot 6)

ASA	audio switch assembly		
	ASC	audio switch controller	
	ASM 1	channel 1	(slot 1)
	ASM 2	channel 2	(slot 2)
	ASM 3	channel 3	(slot 3)
	ASM 4	channel 4	(slot 4)
	ASM 5	channel 5	(slot 5)
	ASM 6	channel 6	(slot 6)
	ASM 7	channel 7	(slot 7)
	ASM 8	channel 8	(slot 8)
	ASM 9	channel 9	(slot 9)
	ASM 10	channel 10	(slot 10)
	ASM 11	channel 11	(slot 11)
	ASM 12	channel 12	(slot 12)
	ASM 13	channel 13	(slot 13)
	ASM PB1	monitor/playback channel 1	(slot PB1)
	ASM PB2	monitor/playback channel 2	(slot PB2)
	ASM Spare	spare	(slot S)

DECtalk Card Configurations

There is one I/O jumper to be set on each DECtalk card:

	FEP Name	FEP Slot #	I/O Address Jumper
1FEP DECtalk 1 (channel 1)	1FEP	2	240
1FEP DECtalk 2 (channel 2)	1FEP	3	250
1FEP DECtalk 3 (channel 3)	1FEP	4	328
1FEP DECtalk 4 (channel 4)	1FEP	5	360
1FEP DECtalk 5 (mon/playback chan 1)	1FEP	6	380
2FEP DECtalk 1 (channel 5)	2FEP	2	240
2FEP DECtalk 2 (channel 6)	2FEP	3	250
2FEP DECtalk 3 (channel 7)	2FEP	4	328
2FEP DECtalk 4 (channel 8)	2FEP	5	360
2FEP DECtalk 5 (mon/playback chan 2)	2FEP	6	380
3FEP DECtalk 1 (channel 9)	3FEP	2	240
3FEP DECtalk 2 (channel 10)	3FEP	3	250
3FEP DECtalk 3 (channel 11)	3FEP	4	328
3FEP DECtalk 4 (channel 12)	3FEP	5	360
3FEP DECtalk 5 (channel 13)	3FEP	6	380
4BKUP DECtalk 1	4BKUP	2	240
4BKUP DECtalk 2	4BKUP	3	250
4BKUP DECtalk 3	4BKUP	4	328
4BKUP DECtalk 4	4BKUP	5	360
4BKUP DECtalk 5	4BKUP	6	380

ASM Card Configurations

There are five jumpers to be set on each ASM card:

	ASA Slot #	Silence Alarm Jumper "JP1"	ACP Channel Sel. Jumper "JP2" & "JP3"	BKUP Live/ Playback Cntrl Jumper "JP4"	FEP Select Jumper "JP5"
ASM 1 (channel 1)	1	EN (Enable)	1	BUL2	FEP1
ASM 2 (channel 2)	2	EN (Enable)	2	BUL2	FEP1
ASM 3 (channel 3)	3	EN (Enable)	3	BUL2	FEP1
ASM 4 (channel 4)	4	EN (Enable)	4	BUL2	FEP1
ASM 5 (channel 5)	5	EN (Enable)	5	BUL2	FEP2
ASM 6 (channel 6)	6	EN (Enable)	6	BUL2	FEP2
ASM 7 (channel 7)	7	EN (Enable)	7	BUL2	FEP2
ASM 8 (channel 8)	8	EN (Enable)	8	BUL2	FEP2
ASM 9 (channel 9)	9	EN (Enable)	9	BUL2	FEP3
ASM 10 (channel 10)	10	EN (Enable)	10	BUL2	FEP3
ASM 11 (channel 11)	11	EN (Enable)	11	BUL2	FEP3
ASM 12 (channel 12)	12	EN (Enable)	12	BUL2	FEP3
ASM 13 (channel 13)	13	EN (Enable)	13	BUL2	FEP3
ASM PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	FEP1
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	FEP2

Cable Label Between DECtalk Card and ASM Card

From	To	Cable Label
1FEP DECtalk 1 “J2" Port	ASM 1 “IN Port”	1-1
1FEP DECtalk 2 “J2" Port	ASM 2 “IN Port”	1-2
1FEP DECtalk 3 “J2" Port	ASM 3 “IN Port”	1-3
1FEP DECtalk 4 “J2" Port	ASM 4 “IN Port”	1-4
2FEP DECtalk 1 “J2" Port	ASM 5 “IN Port”	2-1
2FEP DECtalk 2 “J2" Port	ASM 6 “IN Port”	2-2
2FEP DECtalk 3 “J2" Port	ASM 7 “IN Port”	2-3
2FEP DECtalk 4 “J2" Port	ASM 8 “IN Port”	2-4
3FEP DECtalk 1 “J2" Port	ASM 9 “IN Port”	3-1
3FEP DECtalk 2 “J2" Port	ASM 10 “IN Port”	3-2
3FEP DECtalk 3 “J2" Port	ASM 11 “IN Port”	3-3
3FEP DECtalk 4 “J2" Port	ASM 12 “IN Port”	3-4
3FEP DECtalk 5 “J2" Port	ASM 13 “IN Port”	3-5
1FEP DECtalk 5 “J2" Port	ASM PB1 “IN Port”	1-5
2FEP DECtalk 5 “J2" Port	ASM PB2 “IN Port”	2-5

Cable Label Between DECtalk Card and ASC Card

From	To	Cable Label
4BKUP DECtalk 1 "J2" Port	ASC “BKUP Audio 1" Port	4-1
4BKUP DECtalk 2 "J2" Port	ASC “BKUP Audio 2" Port	4-2
4BKUP DECtalk 3 "J2" Port	ASC “BKUP Audio 3" Port	4-3
4BKUP DECtalk 4 "J2" Port	ASC “BKUP Audio 4" Port	4-4
4BKUP DECtalk 5 “J2" Port	ASC “BKUP Audio 5" Port	4-5

Attachment D

Modification Note - Data Note Pad

Modification Note - Data Note Pad

CRS Mod Note #46
Supplemental Info

Instructions: This form is supplied to assist in the reporting of Configuration Management Data. Technicians are asked to complete this form ***while*** the Modification is being performed. When completed, use form to assist you in reporting the data using the EMRS. DO NOT SUBMIT THIS FORM.

Mod. Completion Date________________________________

Configuration Management Data Pad				
ASN	**Vendor Part Number**	**Serial Numbers**		**Notes**
		Old Part	**New Part**	
B440-2A2	KSP-9521-HW	N/A		
B440-2A2	KSP-9521-HW	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A2A11	EBD07-AA/DTC07-BM	N/A		
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		

Configuration Management Data Pad				
ASN	Vendor Part Number	Serial Numbers		Notes
		Old Part	New Part	
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		
B440-2A6A3	CRS-ASM	N/A		

Attachment E

WS Form A-26 Sample

WS FORM A-26 (4/94)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

ENGINEERING MANAGEMENT REPORTING SYSTEM
MAINTENANCE RECORD

Document Number: **G 49986**

General Information

1. Open Date	Time	2. Initials	3. Response Priority (check one)	4. Close Date	Time
9 / 20 / 00	0900	JMM	○ Immediate ○ Low ○ Routine ⊗ Not Applicable	9 / 20 / 00	1400

5. Description: **Expand CRS from a Typical 4 to a Maximum 13 Configuration**

Equipment Information

6. Station ID	7. Equipment Code	8. Serial Number	9. TM	10. AT	11. How Mal.
FSD	CRSSA	001	M	M	999

12. *EQUIPMENT OPERATIONAL STATUS TIMES*

a. Fully Operational	b. Logistics Delay	Partly Operational	c. All Other	d. Logistics Delay	Not Operational	e. All Other
						5:00

13. *Parts Failure Information*

Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.
1	B440-2A2	5962-01-457-0639	M	M	999	2	1:00
2	B440-2A2A11	5998-01-448-9178	M	M	999	10	2:00
3	B440-2A6A3	NWS9-80-990-0017	M	M	999	10	2:00
4							
5							

14. *Work Load Information*

Type	Staff Hrs.
a. Routine	
b. Non-Routine	
c. Travel	
d. Misc.	
e. Overtime	

Miscellaneous Information

15. Maintenance Comments: **Installed 2 FEPs, 10 DECTalk cards, and 10 ASM cards to expand CRS from Typical 4 to Max 13 configuration, I.A.W. Mod Note 46**

16. Initials: **JMM**

17. *SPECIAL PURPOSE REPORTING*

a. Mod. No.	b. Mod./Act./Deact.Date	c.	d.	e.
46				

18. *CONFIGURATION MGMT. REPORTING (use as directed)*

ASN	Vendor Part No. (New Part)	Serial Number (Old Part)	Serial Number (New Part)
B440-2A2	KSP-9521-HW	N/A	N123456789
B440-2A2	KSP-9521-HW	N/A	N123456789
B440-2A6A3	CRS-ASM	N/A	1234
B440-2A6A3	CRS-ASM	N/A	1234
B440-2A6A3	CRS-ASM	N/A	1234